ELECTRICAL/ELECTRONIC WORKBENCHES

Background

- CNSLINST 9000.1C (Sect 9300.5)
- Builders Specs (Sect 665)
- GSO 665
- NSTM 300R4 Appendix H

Current Guidance

- NSTM 300 R5 Appendix H

General Information

- Electrical/electronic workbenches are used to work on energized electrical and electronic equipment.
- They are used individually and in workshops such as Electrical Repair, AIMD, Electronics, Avionics, and Calibration.
- The workbenches are insulated from the top working surface and below to reduce the shock hazard to maintenance personnel.

Grounding Requirements

- Metal workbenches shall be grounded to the hull and have equipment grounding leads.
- Grounding studs shall be welded to the hull.
- Ground wire can be other than green in color or designation.
  - Replacement wires must be green.

Insulation

- Electrical/Electronic workbenches are insulated from the top working surface to the deck.
- Metal structures and objects adjoining the workbench and within the reach of the technician, **may** be insulated.
- The deck in front of the workbenches shall be covered with electrical grade matting.

Insulation (cont)

- The deck in front of the workbenches shall be covered with electrical grade matting.
- The working surface insulation shall be either 3/8 inch Benelex 401 (a dark brown material) or Arboron secured to the support surface with 1/4-20 nylon screws.

Exposed Metal Surfaces

- Shall be insulated with plastic laminate in accordance with MIL-P-15037.
- The surfaces to be covered are:
  - Front surfaces of cabinet and auxiliary table.
  - Knee surfaces under auxiliary table.
  - Drawer fronts.
  - Foundations (these may be covered with electrical grade matting).

Shelf Area

- The insides of the drawers need not be covered.
- An alternative to insulating the fronts of the shelves is to install a door over the opening.
- The door shall be Benelex, Arboron or other non-conductive material.

Surrounding Deck Area

- Electrical grade sheet deck covering conforming to MIL-M-15562, Type 1, shall be installed in front of insulated workbenches.
- No seams shall be within 3 feet of electrical/electronic workbenches.

Attaching Metal Objects

- Do not defeat the purpose of the insulation by attaching **vices, locks, hasps**, metal tie downs, or other metal hardware to the metal workbench through the insulation.

ELECTRICAL POWER DISCONNECT SWITCHES

- Power disconnect switches **shall** be provided to quickly disconnect workbench power (60Hz, 400Hz, DC).
- The disconnect switch(es) shall not be located on the workbench.
- Three types of switches exist.

TYPE 1 (Preffered)

- One switch (pushbutton station) disconnects all power (60Hz, 400Hz, DC) to all workbench EPOPs and electrical receptacles and test switchboards.
- Located just inside the access to the space.
- Located 48 to 54 inches above the deck, within a **red-painted** target.

TYPE 2 (Most Frequent)

- Individual switches disconnect 60 Hz power, 400 Hz power and DC.
- Multiple disconnect pushbuttons (switches) shall be wired so activation of any pushbutton (switch) will secure ALL power (60Hz, 400Hz DC) to ALL workbenches.

TYPE 3

- Circuit breakers in power panels disconnect power to workbench EPOPs and receptacles and test switchboards.
- Power panels (60Hz, 400Hz, DC) must be installed in the same compartment as the workbenches.
- Circuit breaker(s) inside the power panel(s) shall be **clearly marked** with a **red target** around them for easy identification.

WORKBENCHES and TEST SWITCHBOARDS

- Power for electrical/electronic workbenches and electrical test switchboards in the same compartment shall be controlled by the same power disconnect switch(es).

SIGNS AND LABEL PLATES

DANGER

ELECTRICAL SHOCK DO NOT TOUCH ENERGIZED CIRCUITS

THIS IS AN ELECTRICALLY SAFE WORKBENCH

SIGNS AND LABEL PLATES

DANGER

WORKING ON ENERGIZED ELECTRICAL EQUIPMENT IS PROHIBITED ON THIS WORKBENCH

THIS IS NOT AN ELECTRICALLY SAFE WORKBENCH

SIGNS AND LABEL PLATES

DANGER

DO NOT ATTEMPT TO ADMINISTER FIRST AID OR COME INTO PHYSICAL CONTACT WITH AN ELECTRIC SHOCK VICTIM BEFORE THE POWER IS SHUTOFF

SIGNS AND LABEL PLATES

REMOVAL OF PERSONNEL IN CONTACT WITH ENERGIZED ELECTRICAL CIRCUITS

DO NOT TRY TO REMOVE VICTIM WITH YOUR BARE HANDS.

1. **DE-ENERGIZE THE CIRCUIT IF POSSIBLE.**
2. **IF CIRCUIT CANNOT BE DE-ENERGIZED:**

- **YOU MUST INSULATE YOURSELF FROM HIS ENTIRE BODY BY USING A NON-CONDUCTOR TO PUSH HIM FREE OF THE CONTACT.**
- **IF YOU ARE IN CONTACT WITH A LIVE CIRCUIT AND NO ONE IS NEARBY TO HELP, TRY TO BREAK THE CONTACT BY THROWING YOUR BODY.**

Common Problems

- Type 2 switches do not disconnect all power
- Incorrect signs posted
  - “Decertified” workbench ??
- Electrical grade matting insufficient
- Metal objects installed/exposed